

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (original): A method for replacing a microelectronic spring contact bonded to a terminal of a substrate, the method comprising:

- removing the microelectronic spring contact from the terminal;
- aligning a replacement spring contact over the terminal, the replacement spring contact comprising a base configured to fit over the terminal, and at least one resilient cantilever arm extending from the base, whereby the replacement spring contact is aligned so that the base of the replacement spring contact is opposite to the terminal and the resilient cantilever arm extends away from the substrate; and
- bonding the replacement spring contact to the terminal.

Claim 2 (original): The method of Claim 1, wherein the removing step further comprises cutting the microelectronic spring contact in two adjacent to the terminal.

Claim 3 (original): The method of Claim 1, wherein the bonding step further comprises depositing a bonding material between the terminal and the replacement spring contact.

Claim 4 (original): The method of Claim 3, wherein the bonding step further comprises depositing the bonding material consisting essentially of a solder paste.

Claim 5 (original): The method of Claim 4, wherein the bonding step further comprises applying an electric current across the base of the replacement spring contact using an electrode.

Claim 6 (original): The method of Claim 1, wherein the aligning step further comprises aligning the replacement spring contact having a core of resilient material coated with a conductive material.

Claim 7 (original): The method of Claim 6, wherein the aligning step further comprises aligning the replacement spring contact having the core made of nickel-cobalt alloy.

Claim 8 (original): The method of Claim 6, wherein the aligning step further comprises aligning the replacement spring contact having the core coated with gold or a gold alloy.

Claim 9 (original): The method of Claim 1, wherein the aligning step further comprises aligning the replacement spring contact having the base with at least two legs extending from the base in a direction opposite to the cantilever arm.

Claim 10 (original): The method of Claim 1, wherein the aligning step further comprises aligning the replacement spring contact whereby the at least two legs are on opposite sides of a stub protruding from the terminal.

Claim 11 (canceled)

Claim 12 (previously presented): The method of Claim 31, wherein the release layer comprises aluminum.

Claim 13 (previously presented): The method of Claim 31, wherein the seed layer comprises copper.

Claim 14 (previously presented): The method of 31, wherein the sacrificial layer comprises a photoresist.

Claim 15 (currently amended): The method of ~~Claim 11~~ Claim 19, wherein the step of depositing a contact structure material further comprises electroplating the contact structure material in the at least one recess.

Claim 16 (currently amended): The method of ~~Claim 11~~ Claim 19, wherein the contact structure material comprises nickel-cobalt .

Claim 17 (currently amended): ~~The method of Claim 11, further comprising~~ A method for forming on a substrate a microelectronic spring contact comprising a base at a bottom portion of the spring contact and a tip at a top portion of the spring contact, the method comprising:

depositing a sacrificial layer;

patterning the sacrificial layer to form at least one recess in the shape of a side profile of the microelectronic spring contact;

depositing a contact structure material in the at least one recess;

releasing the contact structure material from the substrate; and

depositing a conductive material over the microelectronic spring contact after the releasing step.

Claim 18 (original): The method of Claim 17, wherein the depositing a conductive material step further comprises plating the conductive material consisting essentially of a layer of gold.

Claim 19 (currently amended): ~~The method of Claim 11,~~ A method for forming on a substrate a microelectronic spring contact comprising a base at a bottom portion of the spring contact and a tip at a top portion of the spring contact, the method comprising:

depositing a sacrificial layer;

patterning the sacrificial layer to form at least one recess in the shape of a side profile of the microelectronic spring contact; and

depositing a contact structure material in the at least one recess;

releasing the contact structure material from the substrate;

wherein the side profile is such that an axis extending between the tip and the base is substantially parallel with a surface of the substrate,

the method further comprising bonding the base to a second substrate after the releasing step, wherein the axis extends away from a surface of the second substrate.

Claim 20 (original): The method of Claim 19, wherein the bonding step further comprises bonding the base to a terminal of the second substrate.

Claim 21 (original): A method for repairing a microelectronic spring contact comprising a beam bonded to at least one post that is in turn bonded to a terminal of a substrate, the method comprising:

- removing the beam from the at least one post, thereby providing a removed beam;
- removing at least a portion of the at least one post from the terminal;
- aligning a replacement post piece over the terminal, the replacement post piece comprising a base configured to fit over the terminal, and at least one replacement post extending upwards from the base, whereby the replacement post piece is aligned so that the base of the replacement post piece is opposite to the terminal and the at least one replacement post extends away from the substrate;
- bonding the replacement post piece to the terminal; and
- bonding a replacement beam to the at least one replacement post, wherein the replacement beam is selected from a group consisting of the removed beam and a new beam essentially identical to the removed beam.

Claim 22 (original): The method of Claim 21, wherein the first removing step further comprises de-soldering the beam from the at least one post.

Claim 23 (original): The method of Claim 21, wherein the second removing step further comprises cutting the at least one post in two adjacent to the terminal.

Claim 24 (original): The method of Claim 21, wherein the first bonding step further comprises applying a solder paste to the terminal.

Claim 25 (original): The method of Claim 24, wherein the first bonding step further comprises applying an electric current across the replacement post piece to activate the solder paste.

Claim 26 (original): The method of Claim 21, wherein the second bonding step further comprises applying a solder paste to the at least one replacement post.

Claim 27 (original): The method of Claim 26, wherein the first bonding step further comprises applying an electric current across a portion of the replacement beam to activate the solder paste.

Claim 28 (original): The method of Claim 21, wherein the aligning step further comprises aligning the replacement post piece made of nickel-cobalt alloy.

Claim 29 (original): The method of Claim 21, wherein the aligning step further comprises aligning the replacement post piece having a base with at least two legs extending from the base in a direction opposite to the at least one post.

Claim 30 (original): The method of Claim 29, wherein the aligning step further comprises aligning the replacement post piece whereby the at least two legs are on opposite sides of a stub protruding from the terminal.

Claim 31 (currently amended): The method of ~~claim 11~~ Claim 19 further comprising:
depositing a release layer on said substrate; and
depositing a seed layer on said release layer,
wherein said sacrificial layer is deposited on said seed layer.

Claim 32 (currently amended): ~~The method of claim 11,~~ A method for forming on a substrate a microelectronic spring contact comprising a base at a bottom portion of the spring contact and a tip at a top portion of the spring contact, the method comprising:

depositing a sacrificial layer;
patterning the sacrificial layer to form at least one recess in the shape of a side profile of the microelectronic spring contact; and

depositing a contact structure material in the at least one recess;
releasing the contact structure material from the substrate;
wherein a first portion of said at least one recess defines said base of said of said spring contact and a second portion of said at least one recess defines said tip of said spring contact, wherein said first portion and said second portion of said at least one recess are disposed in a plane that is substantially parallel to a surface of said substrate.

Claim 33 (canceled)

Claim 34 (currently amended): ~~The method of claim 33,~~ A method of forming an interconnect element, said interconnect element configured to be attached to a final substrate in a first orientation with respect to a surface of said final substrate, said method comprising:

providing a sacrificial substrate; and
forming said interconnect element on said sacrificial substrate in a second orientation with respect to a surface of said sacrificial substrate,

wherein said second orientation is different than said first orientation, and

wherein:

in said first orientation, said interconnect element is upright with respect to said surface of said final substrate; and

in said second orientation, said interconnect is on one of its sides with respect to said surface of said sacrificial substrate.

Claim 35 (currently amended): ~~The method of claim 33,~~ A method of forming an interconnect element, said interconnect element configured to be attached to a final substrate in a first orientation with respect to a surface of said final substrate, said method comprising:

providing a sacrificial substrate; and
forming said interconnect element on said sacrificial substrate in a second orientation with respect to a surface of said sacrificial substrate,

wherein said second orientation is different than said first orientation, and

wherein said interconnect element comprises a base and a tip, and:

in said first orientation, said base is attached to said final substrate, and said tip is spaced apart from said final substrate; and

in said second orientation, said base and said tip are disposed in a plane that is substantially parallel to said surface of said sacrificial substrate.

Claim 36 (currently amended): ~~The method of claim 33,~~ A method of forming an interconnect element, said interconnect element configured to be attached to a final substrate in a first orientation with respect to a surface of said final substrate, said method comprising:

providing a sacrificial substrate; and
forming said interconnect element on said sacrificial substrate in a second orientation with respect to a surface of said sacrificial substrate,

wherein said second orientation is different than said first orientation, and

wherein said interconnect element comprises a base and a tip, and

in said first orientation, an axis extending from said base to said tip extends away from said surface of said final substrate; and

in said second orientation, said axis is substantially parallel to said surface of said sacrificial substrate.

Claim 37 (currently amended): The method of ~~claim 33~~ claim 47 further comprising releasing said interconnect element from said sacrificial substrate.

Claim 38 (previously presented): The method of claim 37, wherein said step of providing a sacrificial substrate comprises providing a sacrificial substrate having a release layer.

Claim 39 (previously presented): The method of claim 38, wherein said step of releasing said interconnect element comprises removing said release layer.

Claim 40 (previously presented): The method of claim 37 further comprising attaching said released interconnect element to said final substrate in said first orientation.

Claim 41 (currently amended): The method of ~~claim 33~~ claim 47, wherein said step of forming said interconnect element comprises depositing material in a patterned sacrificial layer.

Claim 42 (currently amended): ~~The method of claim 41,~~ A method of forming an interconnect element, said interconnect element configured to be attached to a final substrate in a first orientation with respect to a surface of said final substrate, said method comprising:

providing a sacrificial substrate; and
forming said interconnect element on said sacrificial substrate in a second orientation with respect to a surface of said sacrificial substrate,
wherein said second orientation is different than said first orientation,
wherein said step of forming said interconnect element comprises depositing material in a patterned sacrificial layer, and
wherein said sacrificial layer comprises a photoresist.

Claim 43 (currently amended): ~~The method of claim 41,~~ A method of forming an interconnect element, said interconnect element configured to be attached to a final substrate in a first orientation with respect to a surface of said final substrate, said method comprising:

providing a sacrificial substrate; and
forming said interconnect element on said sacrificial substrate in a second orientation with respect to a surface of said sacrificial substrate,
wherein said second orientation is different than said first orientation,
wherein said step of forming said interconnect element comprises depositing material in a patterned sacrificial layer, and
wherein said sacrificial layer is patterned to define a side profile of said interconnect element.

Claim 44 (currently amended): ~~The method of claim 41,~~ A method of forming an interconnect element, said interconnect element configured to be attached to a final substrate in a first orientation with respect to a surface of said final substrate, said method comprising:

providing a sacrificial substrate; and
forming said interconnect element on said sacrificial substrate in a second orientation with respect to a surface of said sacrificial substrate,
wherein said second orientation is different than said first orientation,
wherein said step of forming said interconnect element comprises depositing material in a patterned sacrificial layer, and
wherein the step of depositing material comprises electroplating said material.

Claim 45 (previously presented): The method of claim 44, wherein said step of providing a sacrificial substrate further comprises providing a sacrificial substrate having a seed layer.

Claim 46 (previously presented): The method of claim 45, wherein said step of electroplating said material comprises electroplating said material onto said seed layer.

Claim 47 (currently amended): ~~The method of claim 33~~ A method of forming an interconnect element, said interconnect element configured to be attached to a final substrate in a first orientation with respect to a surface of said final substrate, said method comprising:

providing a sacrificial substrate; and
forming said interconnect element on said sacrificial substrate in a second orientation with respect to a surface of said sacrificial substrate,
wherein said second orientation is different than said first orientation,
said method further comprising forming a plurality of said interconnect elements on said sacrificial substrate.

Claim 48 (previously presented): The method of claim 47, wherein said plurality of interconnect elements are tied together.

Claim 49 (previously presented): The method of claim 48, wherein said plurality of interconnect elements are tied together by a tie bar and tabs.